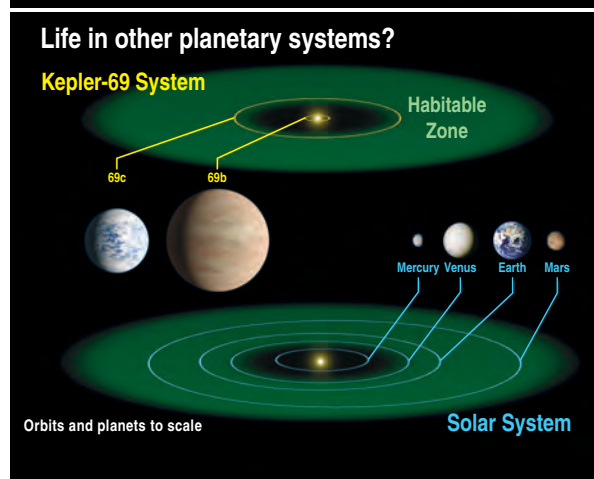
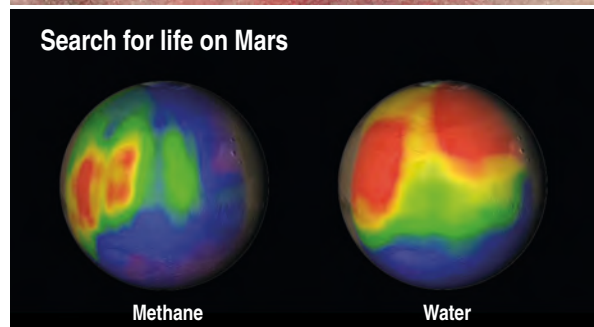
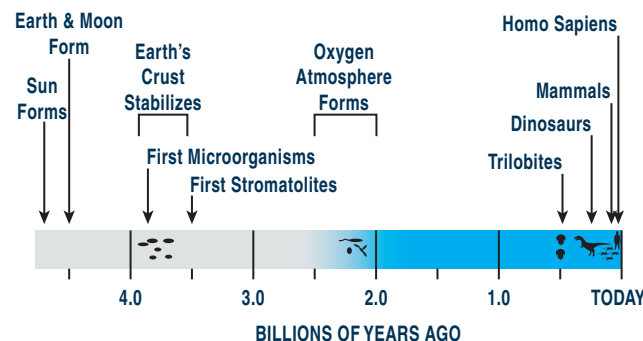


## What is Astrobiology?

**W**hat exactly is astrobiology? Astrobiology is the study of the origin and formation of the building blocks of life in extraterrestrial environments. Researchers of the Goddard Center for Astrobiology investigate these beginnings and examine whether the delivery of these primordial materials and water to the early Earth enabled the emergence and evolution of life. They also extend these studies to other planets and moons, and to other planetary systems. This research requires a multidisciplinary approach involving astronomy, biology, chemistry, geology and physics.



## A Cosmic Timeline Towards Life



**L**ife is the product of nearly 14 billion years of cosmic evolution following the Big Bang. The Big Bang produced atoms of hydrogen, helium and lithium, the lightest elements. Other elements were made inside the first stars, but formation of the heavier elements required cycling through many generations of stellar birth and death. The Earth and life as we know it required this heritage — you are made of star stuff! Thus, the cosmos evolved towards greater complexity in a progression that enabled the emergence of life.

### Scientists who study astrobiology ask the questions:

- How did life begin here?
- How has the environment changed since Earth's formation?
- Why is Earth a life-sustaining habitat now?
- Can life exist elsewhere in the Solar System and in the Universe?

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Greenbelt, Maryland 20771

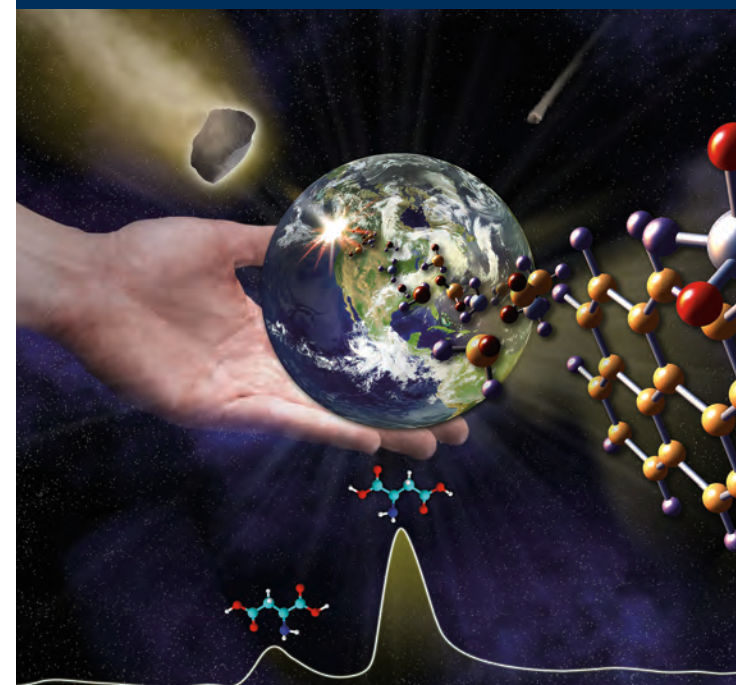
[astrobiology.gsfc.nasa.gov](http://astrobiology.gsfc.nasa.gov)  
[gca-info@list.nasa.gov](mailto:gca-info@list.nasa.gov)



National Aeronautics and  
Space Administration



## The Astrobiology Walk



### Why is Earth Wet and Alive?

Earth as a Habitat: From Origin to Present

[www.nasa.gov](http://www.nasa.gov)



# The Cosmic Progression Towards Life

This “walk through time” illustrates critical steps along the pathway to life today, and scientific efforts at Goddard to address them.



## 01> Earth as a Habitat – From Origin to Present

This introductory station to the Astrobiology Walk presents the timeline of the cosmic progression towards life, from the Big Bang about 14 billion years ago to the present. Each station in this exhibit describes a different epoch. You can identify the station by its distinctive 3D iconic object.



## 02> The Cosmic Cycle of Matter

Do you know that we are made of star stuff? This station explains how atoms and molecules that are essential for life are formed in the cosmic cycle of stellar birth and death and in outer space.



## 03> Protostellar ‘Factories’ Churn Out Chemicals

How are complex organic (carbon-based) molecules “manufactured” and incorporated into stars and planetary systems? This station describes the chemical processes that occur during star and planet formation. Tiny dust grains play an important role in this evolution.



## 04> Formation of the Earth and its Moon

Visit this station to learn how our Earth was formed and how it acquired its Moon. Learn how NASA astronauts helped to reveal Earth’s early history by landing on the Moon.



## 05> Building a Wet and Habitable Earth

Do you know how Earth has evolved since its formation to arrive at its current habitable condition, wet and teeming with life? Did Earth always have a water ocean? Did Earth and other planets in the Solar System follow the same orbits in the past? Answers are found at this station.



## 06> Messengers from the Early Solar System

Comets and asteroids offer more than a spectacular sight in the sky. They hold secrets of the early Solar System. Rich in water and organic materials, they may even carry building blocks of life. Come touch a 3D model of a comet’s core visited by a NASA spacecraft.



## 07> Meteorites Contain Ingredients for Life

Do you know that life on Earth uses left-handed amino acids to build proteins? Did meteorites deliver these left-handed ingredients to the early Earth? Learn how scientists analyze meteorites and the building blocks of life that they have found.



## 08> Life Transformed Earth

This station describes one of Earth’s major environmental changes – the Great Oxidation Event, which made multicellular life possible. You can touch rocks that were formed more than 2.3 billion years ago by some of Earth’s oldest life. Also discover how life can survive in extreme conditions.



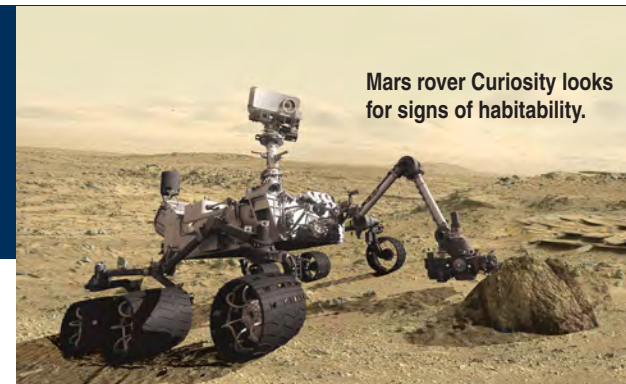
## 09> Search for Life in the Solar System

Find out how scientists search for signs of life in other places in the Solar System. Where do they target their searches? Why has NASA sent several rovers to investigate Mars? Come and touch a globe of Mars to explore what its surface is like and see where NASA landed its rovers.



## 10> A Galaxy Full of Diverse Exoplanets

Astronomers have discovered many exoplanets in the past decade, and the number is increasing. But scientists have yet to find another Earth-like habitable planet. Learn how scientists plan to pursue the planet quest with future space observatories and techniques.



Mars rover Curiosity looks for signs of habitability.

